

Appl. No. 09/706,926  
Amdt. dated January 20, 2005  
Reply to office action of October 20, 2004

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

Claim 1 (currently amended): A method for representing cartographic data in a computer-based system, comprising:

providing a cartographic database containing data that represents a plurality of geographic features;

computing a plurality of wavelet and scaling coefficients corresponding to from said data that represents one of said at least one function representing a geographic features in a the cartographic database, wherein said wavelet coefficients obtained with a wavelet, wherein said wavelet being one of a family of functions having a form  $\psi_{ab}(x) = |a|^{-1/2} \psi\left(\frac{x-b}{a}\right)$ , wherein  $\psi_{ab}(x)$  is called a mother wavelet,  $a$  is called a dilation parameter,  $b$  is called a translation parameter, and  $x$  is an independent variable;

indexing the wavelet coefficients by a plurality of display scales; and

storing the wavelet and scaling coefficients in a computer-usable database on a physical storage medium, the coefficients being usable for displaying-representing the cartographic data a representation of the geographic feature in the computer-based system.

Claim 2 (currently amended): The method of claim 1, wherein the data that represents the geographic feature is originally represented by a plurality of data points indicating locations.

Claim 3 (original): The method of claim 2, wherein the data points are selected from the group consisting of coordinate pairs and a coordinate triples.

Claim 4 (original): The method of claim 1, wherein the geographic feature is the boundary of a feature selected from the group consisting of a road, waterway, building, park, lake, railroad track, and airport.

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Claim 5 (currently amended): The method of claim 2, wherein the step of computing the wavelet coefficients ~~and scaling coefficients~~ includes applying a wavelet transform to a function defined by the data points representing the geographic feature.

Claim 6 (currently amended): The method of claim 1, wherein the step of computing the wavelet coefficients ~~and scaling coefficients~~ includes:

computing the wavelet coefficients by performing a least-squares fit.

Claim 7 (currently amended): The method of claim 1, wherein the wavelet ~~and scaling~~ coefficients are computed using a semi-discrete orthonormal wavelet transform.

Claim 8 (currently amended): A method of displaying on a computer output device a ~~function representing a representation of a~~ geographic feature, comprising:

retrieving from a computer-usable database a plurality of wavelet ~~and scaling~~ coefficients associated with the geographic feature, wherein a wavelet being one of a family of functions having a form  $\psi_{ab}(x) = |a|^{-1/2} \psi\left(\frac{x-b}{a}\right)$ , wherein  $\psi_{ab}(x)$  is called a mother wavelet,  $a$  is called a dilation parameter,  $b$  is called a translation parameter, and  $x$  is an independent variable, the coefficients being derived from a plurality of data points specifying geographic locations according to a predetermined reference system;

computing ~~the a function that represents~~ representing the geographic feature using the retrieved wavelet ~~and scaling~~ coefficients; and

using the function to display ~~displaying the function the representation of the~~ geographic feature on the computer output device.

Claim 9 (currently amended): The method of claim 8, ~~wherein the data points are selected from the group consisting of coordinate pairs and a coordinate triples~~ further comprising:

performing a zooming operation to display another representation of said geographic feature at a different scale.

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Claim 10 (original): The method of claim 8, wherein the geographic feature is selected from the group consisting of a road, waterway, building, park, lake, railroad track, and airport.

Claim 11 (currently amended): A system for displaying on a computer output device a representation of a geographic feature, comprising:

a database storing a plurality of wavelet ~~and scaling~~ coefficients associated with the geographic feature, wherein a wavelet being one of a family of functions having a form  $\psi_{ab}(x) = |a|^{-1/2} \psi\left(\frac{x-b}{a}\right)$ , wherein  $\psi_{ab}(x)$  is called a mother wavelet,  $a$  is called a dilation parameter,  $b$  is called a translation parameter, and  $x$  is an independent variable, the wavelet ~~and scaling~~ coefficients being derived from a plurality of data points specifying geographic locations according to a predetermined reference system, wherein the wavelet coefficients are associated with a plurality of display scales;

a processor configured to calculate ~~a function~~ the representation of the geographic feature at a predetermined display scale using the wavelet and scaling coefficients associated with the predetermined display scale, the function representing the geographic feature; and  
 a display device for displaying the ~~function~~ representation of the geographic feature.

Claim 12 (original): The system of claim 11, wherein the data points are selected from a group consisting of coordinate pairs and coordinate triples.

Claim 13 (currently amended): A method of generating a computer-usable database that represents cartographic data ~~using a plurality of wavelet and scaling coefficients~~, comprising:

providing a predetermined database containing data indicating that represents the ~~cartographic data using~~ a plurality of data points specifying geographic locations;

computing a plurality of wavelet ~~and scaling~~ coefficients from the data points, wherein a wavelet being one of a family of functions having a form  $\psi_{ab}(x) = |a|^{-1/2} \psi\left(\frac{x-b}{a}\right)$ , wherein  $\psi_{ab}(x)$  is called a mother wavelet,  $a$  is called a dilation parameter,  $b$  is called a

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translation parameter, and  $x$  is an independent variable, wherein said wavelet ~~and scaling~~ coefficients are used to represent the cartographic data; and

storing the wavelet ~~and scaling~~ coefficients in the computer-usable database on a physical storage medium.

Claim 14 (original): The method of claim 13, wherein the data points are selected from the group consisting of coordinate pairs and coordinate triples.

Claim 15 (original): The method of claim 13, wherein the geographic feature is the boundary of a feature selected from the group consisting of a road, waterway, building, park, lake, railroad track and airport.

Claim 16 (currently amended): A system of generating a computer-usable database that represents cartographic data ~~using a plurality of wavelet and scaling coefficients~~, comprising:

a first computer-usable database storing the cartographic data that represents a plurality of geographic features, represented using said data that represents one of said geographic features comprises a plurality of data points specifying geographic locations;

a processor configured to compute a plurality of wavelet ~~and scaling~~ coefficients from the data points specifying geographic locations, wherein said wavelet ~~and scaling~~ coefficients provide a representation of said geographic feature ~~are used to represent the cartographic data~~, wherein a wavelet being one of a family of functions having a form

$\psi_{ab}(x) = |a|^{-1/2} \psi\left(\frac{x-b}{a}\right)$ , wherein  $\psi_{ab}(x)$  is called a mother wavelet,  $a$  is called a dilation

parameter,  $b$  is called a translation parameter, and  $x$  is an independent variable; and

a second computer-usable database on a physical storage medium, operatively coupled to the processor, for storing the wavelet ~~and scaling~~ coefficients.

Claim 17 (original): The system of claim 16, wherein the data points are selected from the group consisting of coordinate triples and coordinate pairs.

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Claim 18 (currently amended): The system of claim 16, wherein the wavelet coefficients ~~and scaling coefficients~~ are computed by applying a wavelet transform to a function defined by the data points representing a geographic feature.

Claim 19 (original): The system of claim 16, wherein the wavelet coefficients are computed by performing a least-squares fit.

Claim 20 (currently amended): A method for generating a database error metric in a computer-based system, comprising:

computing a first plurality of wavelet ~~and scaling~~ coefficients from a plurality of first data points included in a first cartographic database, wherein said wavelet ~~and scaling~~ coefficients represent geographic features;

computing a second plurality of wavelet ~~and scaling~~ coefficients from a plurality of data points included in a second cartographic database, wherein said wavelet ~~and scaling~~ coefficients represent geographic features, wherein a wavelet being one of a family of functions having a form  $\psi_{ab}(x) = |a|^{-1/2} \psi\left(\frac{x-b}{a}\right)$ , wherein  $\psi_{ab}(x)$  is called a mother wavelet,  $a$  is called a dilation parameter,  $b$  is called a translation parameter, and  $x$  is an independent variable; and

generating the database error metric based on a wavelet transform involving the first and second pluralities of wavelet coefficients, wherein said database error metric provides a measurement comparing said first cartographic database and said second cartographic database.

Claim 21 (original): The method of claim 20, wherein the error metric is a total error metric based on a plurality of wavelet scales.

Claim 22 (original): The method of claim 20, further comprising:  
selecting a wavelet scale; and

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restricting the error computation to the selected wavelet scale to generate a layer error metric.

Claim 23 (previously presented): The method of claim 20, wherein the data points are selected from the group consisting of coordinate pairs and coordinate triples.

Claim 24 (currently amended): A system for generating a database error metric, comprising:  
 a first cartographic database for storing a first plurality of data points;  
 a second cartographic database for storing a second plurality of data points; and  
 a processor, operatively coupled to the first and second cartographic databases, configured to compute a first plurality of wavelet ~~and-sealing~~ coefficients and a second plurality of wavelet ~~and-sealing~~ coefficients, respectively, from the first and second pluralities of data points, wherein said wavelet ~~and-sealing~~ coefficients represent geographic features, wherein a wavelet being one of a family of functions having a form

$$\psi_{ab}(x) = |a|^{-1/2} \psi\left(\frac{x-b}{a}\right), \text{ wherein } \psi_{ab}(x) \text{ is called a mother wavelet, } a \text{ is called a dilation}$$

parameter,  $b$  is called a translation parameter, and  $x$  is an independent variable, the processor generating a database error metric based on the first and second pluralities of wavelet ~~and-sealing~~ coefficients, wherein said database error metric provides a measurement comparing said first cartographic database and said second cartographic database.

Claim 25 (previously presented): The system of claim 24, wherein the error metric is a total error metric based on a plurality of wavelet scales.

Claim 26 (original): The system of claim 24, wherein the processor is configured to restrict the error computation to a selected wavelet scale to generate a layer error metric.

Claim 27 (original): The system of claim 24, wherein the data points are selected from the group consisting of coordinate triples and coordinate pairs.